Assuming you will have the opportunity to broadcast HDTV in a new, simulcast channel, you will have to make decisions regarding its implementation by your stations. Given that there are likely to be limited capital and personnel resources for the implementation of HDTV at your group's operations, it seems probable that you will prioritize the implementation among your stations. In thinking through your plan for each station, use the cost estimates indicated in the cover letter to this questionnaire. Please take account of the competition you can expect from competing media (e.g. cable, DBS, pre-recorded tape) that will be implementing HDTV on an accelerated schedule. Remember that other stations in your markets will be facing the same competition.

To help the Working Party understand how you might structure your group's implementation of HDTV, please fill in the following chart for the five largest stations in your group. Use the same stations and in the same order as in the chart on the preceding page. Year one should be taken as the year following the final FCC decision. Indicate for each station when work would begin by inserting the letter "S." Show when network or equivalent program pass-through will be achieved with the letter "P." Use the letter "C" to indicate when conversion to local HDTV program origination will be completed. Show any of these events which you foresee occuring later than year 6 in the column at the right end of the chart.

| Station | Year 1 | 2 | 3 | 4 | 5 | 6 | 6+ |
|---|---|---|---|---|---|---|---|
| I | — | — | — | — | — | — | — |
| II | — | — | — | — | — | — | — |
| III | — | — | — | — | — | — | — |
| IV | — | — | — | — | — | — | — |
| V | — | — | — | — | — | — | — |

Thank you very much for your time and cooperation.

REV. 5.0: May 12, 1990

## Appendix B

## Survey of TV Station Chief Engineers

### Summary

The personnel resources available for conversion to HDTV can significantly affect the implementation schedule. IS/WP-2 decided to gather relevant information from a sample of Chief Engineers. The survey objectives were to obtain estimates of the current personnel resources and the personnel resources that could be made available for a conversion project, for each individual station. Of particular concern was the presence of personnel capable of doing the necessary design work, since such skilled and experienced design personnel were believed to be in short supply. Questions were also asked about the station operation and size so that responses from similar stations could be grouped.

### Sample Design

The TV Fact Book list of all stations was the basis of the sample. The entries were listed and a random number used to determine the start point. A skip interval of 22 was used to produce a list of 150 selections. Each selection was assigned a control number. A subsample consisting of the first 120 control numbers was used to conduct the survey. The list was reviewed and translator stations were removed.

### Methodology/Administration

The survey was administered via telephone using one interviewer. The objective was to obtain 100 completed questionnaires. Contact with each of the 120 primary sample respondents was attempted once before contact with any was attempted a second time. A second attempt was made to reach all those not contacted in the first round, again in order, before a third attempt. Third (final) attempts were then made. On the third try, messages were left requesting return phone calls from those persons not reached. Therefore, call-backs could have biased the contact rate somewhat. After completing the primary sample following this approach, there were 86 completed questionnaires. Since this was an inadequate number of completed questionnaires, calls were made to the remaining sample. Seven completed questionnaires were obtained from this group before the end of the survey period. The survey administrator recommended that work stop at that point, and the recommendation was accepted by the Working Party. The data reduction effort uncovered a need for clarification about the VTR format, and several stations were recontacted to clarify their responses.

### Response Rate

Collection and calculation of contact and response rate statistics was not part of the survey administration for budgetary reasons. Only two Chief Engineers who were

reached did not take the time to respond to all the questions. The contact rate for the primary sample was 73 per cent. The cooperation rate of those contacted was 98 per cent. Including the supplemental sample, the overall response rate is estimated at 70 per cent or better.

**Questionnaire Design**

The questionnaire had three major sections. The first section was designed to gather information to be used to characterize the station. The next section was designed to assess capability and size of the engineering staff. The third section was designed to obtain an estimate of the personnel resource available to the station for a major technical project. See the attached questionnaire for specific questions.

**Data Reduction**

The data from 93 respondents was first organized into a spreadsheet format so that it was all contained in one table. In analyzing this data, IS/WP-2 decided that it should be grouped into three categories of small stations (one studio), medium stations (two studios), and large stations (three or more studios) in order to show any differences due to station size. The results of this grouping are given in the attached spreadsheet for the 39 questions asked in the survey. For each station size category there are three columns giving the total, mean, and standard deviation of the responses. A grand total (sum of the three categories) of the responses is also included.

A breakout of the percentage of stations, as a function of how many studios they have, can be seen in the attached pie chart. Here one can see that about two-thirds of the stations surveyed have only one studio.

For the type and ownership of station, the data shows that 80% were commercial versus non-commercial and that 65% were part of a group.

The first part of the questionnaire deals with the type and quantities of facilities and equipment each station has. As seen in questions 1 through 15 on the spreadsheet, the mean quantities per station increase with increasing station size.

Of particular interest to IS/WP-2 were the results of the questions on staff capable and available to do design of a new production (studio) facility and a new transmitter facility. Also of particular interest was the level of support each station expected from its Group/Owner or Co-owned station(s). These data are shown plotted on the attached 3-D graphs. The first graph (people available for crash design of production facility) was generated by taking the product of the number of people capable of doing the design (question 18) and the percentage of their availability (question 35). This reveals that there is no significant difference in available design people due to station size. On average, slightly more than one person per station is available. The second graph (people available for crash design of transmitter facility) shows similar results

except that the average is somewhat less than one person per station. The next two graphs show what effort (in man-days/week) is expected from their Group/Owner or Co-owned station(s) for design of new studio and transmitter respectively. About 95% of the stations expect no help at all. The graphs depict this but also indicate that the 5% expecting help is composed almost entirely of the small stations.

**Statistical Significance**

No sophisticated analysis of the response distributions was undertaken. Based upon a Gaussian distribution, there is a 68 per cent probability that a single question's mean response, plus or minus a standard deviation, is representative of the universe of television stations. Since the distributions do not appear to be Gaussian, the results should be used with caution.

## RESOURCE QUESTIONNAIRE

**Control #**_____

Good morning/afternoon Mr/Mrs/Ms. _____

The FCC has established an advisory committee to help set the HDTV standards for the US. The subcommittee I am working with is trying to figure out how HDTV would be implemented.

We are conducting a survey to learn more about the real world of station operations. We will use the results in our implementation plans. We have called you because we think you are the person at your station with the best information about your station's technical capabilities. We would really appreciate it if you could spare a few minutes to answer some questions. If at any time you feel the questions could be better answered by someone else, please tell me. When our survey is complete we will send you a summary of the results. if you wish.

*Check if desires summary results* _____

*If respondent asks how long this will take:* [12 to 15 minutes]
*If respondent can't talk now, fill out attempt log on cover sheet and make appointment for call back.*

First, we would like some information about your station:

How many studios do you have? (1)_____

What is the total number of studio cameras? (2)_____

How many post-production editing rooms (or areas) are there? (3)_____

Is your on-air playback and switching computer-control? (4)_____

Approximately what is the total number of VTRs in the station, excluding ENG? (5)_____

What is the primary format used? (6)_____

How many separate ENG editing areas (or rooms)? (7)_____

How many VTRs are there in the ENG areas? (8)_____

How many portable VTRs are there for ENG? (9)_____

What is the ENG format? (10)_____

How many ENG trucks do you have? (11)_____

How many external feeds into the station? (12)_____
How many of these are from satellite receivers? (13)_____
How many of these are from microwave? (14)_____
How many of these are from land line? (15)_____

Thank you. Next we would appreciate some general information about the station staff.

How many people does it take at any one time to maintain your on-air operation? (16)__ _

How many man-weeks are spent each week doing system design, equipment maintenance; or new equipment installation? (17)_____

Notes:_____

Of the station's technical staff, including you, how many are capable of designing a complete new production facility? (18)_____

How many are capable of designing a new transmitter facility? (19)_____

Taking these two groups together, what is the total number of people? (20)_____

Do you have anyone dedicated to designing new equipment installations? (21)_____

*If yes*: How many? (22)_____

*If no*: What part of someone's time is spent on this task (man-days/year)? (23)_____

Please classify your station as

Commercial (24)_____ or Non-Commercial (25)_____

Are you part of a group ? (26) Yes _____ No _____

*If yes:* What is the group's name? (27)_____
*If no:* What is the owner's name? (28)_____

*Choose the appropriate word from [ ] below.*

Do you have regular technical design help from your [group]/[owner] or some co-owned station? (29) Yes _____ No _____

*If yes:* How many man-days per year? (30)_____

Do you have regular technical design help from equipment vendors? (31) Yes _____ No _____

*If yes:* How many man-days per year? (32) _____

Do you utilize service contracts for equipment maintainance? (33) Yes _____ No _____

Approximately how much outside consultant time do you use for design of new installations? (man-days per year)? (34)_____

You have been very helpful. We only have a few more questions; for these, I would like you to assume that you have been told by your management that you need to undertake a large technical project such as building a new NTSC station on a crash basis. There is no budget established and you have been told that cost is secondary. Also assume that all regulatory requirements and permits will be handled by someone else.

We would like you to think about the amount of design manpower for such a project that would be provided by your current staff or by group personnel. You should assume that all other new equipment/projects would be canceled in order to work on this project. In other words, the station would have to be kept on the air; but any non-critical tasks would be deferred until this one was complete. The total project duration will be many months long; so sustainable levels, as contrasted with two week push levels are what we are after. Both the studio and the transmitter would be worked on in parallel.

*If concern expressed by respondent about estimates:*

[We know that the quality of the estimates would be better if you had more specifics and time to consider this; but we really need your best estimates at this time.]

For the studio first:

What fraction of the previously mentioned _____ <*take number from question (18)*> people with the skills to design the production facility could be made available for this? (35)_____

How many man-days per week do you think could be provided by your owner/group or sister station employees? (36)_____

Now for the transmitter:

What fraction of the ____ <*take number from question (19)*> people you mentioned earlier could be made available for the transmitter design? (37)_____

How many man-days per week could be provided by owner/group or sister station employees? (38)_____

Can you give us the name of any outside consultant or consultants you would use for design help? (39)_____

_____

_____

Thank you very much for your time and cooperation.

Rev. 3.4: 12/19/90

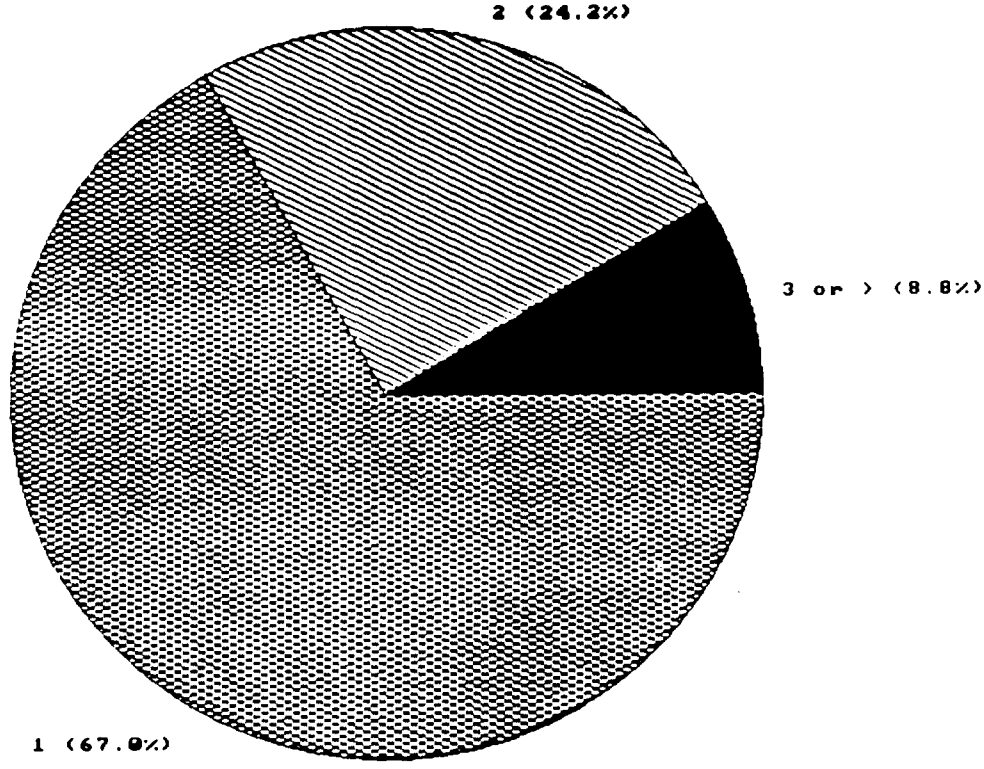
FILE: ISWP2DAC 8-30-91

| STATION INFORMATION | | | GRAND TOTAL | TOTAL | SMALL MEAN | STD |
|---|---|---|---|---|---|---|
| (1) Number Of Studios | | | 131 | 61 | 1 | 0 |
| (2) Number Of Studio Cameras | | | 313 | 166 | 2.72 | 0.73 |
| (3) Number Of Post-Production Editing Rooms/Areas | | | 141 | 91 | 1.49 | 1.05 |
| (4) On-Air Playback/Switching Computer- Controlled | | YES | 18 | 9 | 0.15 | 0.35 |
| | | NO | 73 | 52 | 0.85 | 0.35 |
| (5) Total Number Of VTR's (excluding ENG) | | | 1556 | 970 | 15.9 | 8.5 |
| (6) Primary Format Used | | 1" | 40 | | | |
| | | M2 | 11 | | | |
| | BETA | SP | 8 | | | |
| | | D2 | 2 | | | |
| | | BETA | 13 | | | |
| | | 2" | 7 | | | |
| | | 3/4" | 32 | | | |
| | | 3/4"SP | 4 | | | |
| | | SVHS | 1 | | | |
| (7) Number Of Separate ENG Editing Areas | | | 345 | 168 | 2.8 | 2.9 |
| (8) Number of VTR's In ENG Areas | | | 979 | 466 | 7.6 | 10.7 |
| (9) Number Of Portable VTR's For ENG | | | 636 | 329 | 5.4 | 4.7 |
| (10) ENG Format | | M2 | 5 | | | |
| | Beta | SP | 5 | | | |
| | | 1" | 2 | | | |
| | | BETA | 30 | | | |
| | | 3/4" | 48 | | | |
| | | 3/4"SP | 4 | | | |
| | | SVHS | 3 | | | |
| | | Hi 8 | 3 | | | |
| (11) Number Of ENG Trucks/Cars | | | 97 | 45 | 0.74 | 0.99 |
| (12) Number Of External Feeds Into Station | | | 869 | 488 | 8 | 3.85 |
| (13) From Satellite Receivers | | SATELLITE | 618 | 376 | 6.16 | 2.64 |
| (14) From Microwave | | MICROWAVE | 215 | 95 | 1.56 | 2.16 |
| (15) From Land Line | | LAND LINE | 33 | 17 | 0.28 | 1.37 |
| **STAFF INFORMATION** | | | | | | |
| (16) Number Of People To Maintain On-Air Operation | | | 176.5 | 108 | 1.77 | 1.82 |
| (17) Man-Weeks/Week For Sys. Design, Equipment Maintenance, Or New Equipment Installation | | | 386.7 | 205.3 | 3.37 | 2.8 |
| (18) Staff Capable Of Designing New Production Facility | | | 218 | 124 | 2.03 | 0.99 |
| (19) Staff Capable Of Designing New Transmitter Facility | | | 174 | 100 | 1.64 | 0.91 |
| (20) Total People To Do Both Designs | | | 254 | 140 | 2.3 | 1.21 |
| (21) Dedicated Staff For New Equipment Installation | | YES | 4 | 2 | 0.03 | 0.18 |
| | | NO | 87 | 59 | 0.97 | 0.18 |
| (22) How Many Dedicated People For (21) | | | 8 | | | |
| (23) Partial Effort (Man-Days/Year) | | | 4726.3 | 2556.8 | 41.9 | 49.5 |
| Total Effort (Man-Days/Year)= 260*(22)+(23) | | | 6806.3 | 3856.8 | 63.2 | 138 |
| **OWNERSHIP INFORMATION** | | | | | | |
| (24) Commercial | COMMERCIAL | YES | 73 | 53 | 0.87 | 0.34 |
| (25) Non-Commercial | NON-COMMERCIAL | YES | 18 | 8 | 0.13 | 0.34 |
| (26) Part Of A Group | PART OF GROUP | YES | 59 | 43 | 0.7 | 0.46 |
| | | NO | 32 | 18 | 0.3 | 0.46 |
| (27) Group's Name | | | | | | |
| (28) Owner's Name | | | | | | |
| **SUPPORT INFORMATION** | | | | | | |
| (29) Design Help From Group/Owner/Co-Owned Station | | YES | 5 | 4 | 0.07 | 0.25 |
| | | NO | 86 | 57 | 0.93 | 0.25 |
| (30) Man-Days/Year For (29) | | | 109 | 107 | 1.78 | 7.81 |
| (31) Design Help From Equipment Vendors | | YES | 22 | 14 | 0.23 | 0.42 |
| | | NO | 69 | 47 | 0.77 | 0.42 |
| (32) Man-Days/Year For (31) | | | 152 | 97 | 1.59 | 4.6 |
| (33) Service Contracts Used | | YES | 10 | 4 | 0.07 | 0.25 |
| | | NO | 81 | 57 | 0.93 | 0.25 |
| (34) Consultant Time (Man-Days/Year) Used For Design Of New Instalations | | | 231 | 146 | 2.39 | 8.55 |
| **CRASH DESIGN OF NEW FACILITY** | | | | | | |
| STUDIO | | | | | | |
| (35) Percent Of (18) Available | | | | | 47.4% | 26.0% |
| (36) Man-Days/Week Provided By Owner/Group/Sister Station | | | 110.3 | 102.8 | 1.69 | 3.28 |
| TRANSMITTER | | | | | | |
| (37) Percent Of (19) Available | | | | | 37.1% | 29.9% |
| (38) Man-Days/Week Provided By Owner/Group/Sister Station | | | 58.45 | 55.2 | 0.91 | 2.21 |
| (39) Can You Name Outside Consultants You Would Use | | YES | 36 | | | |
| | | NO | 57 | | | |

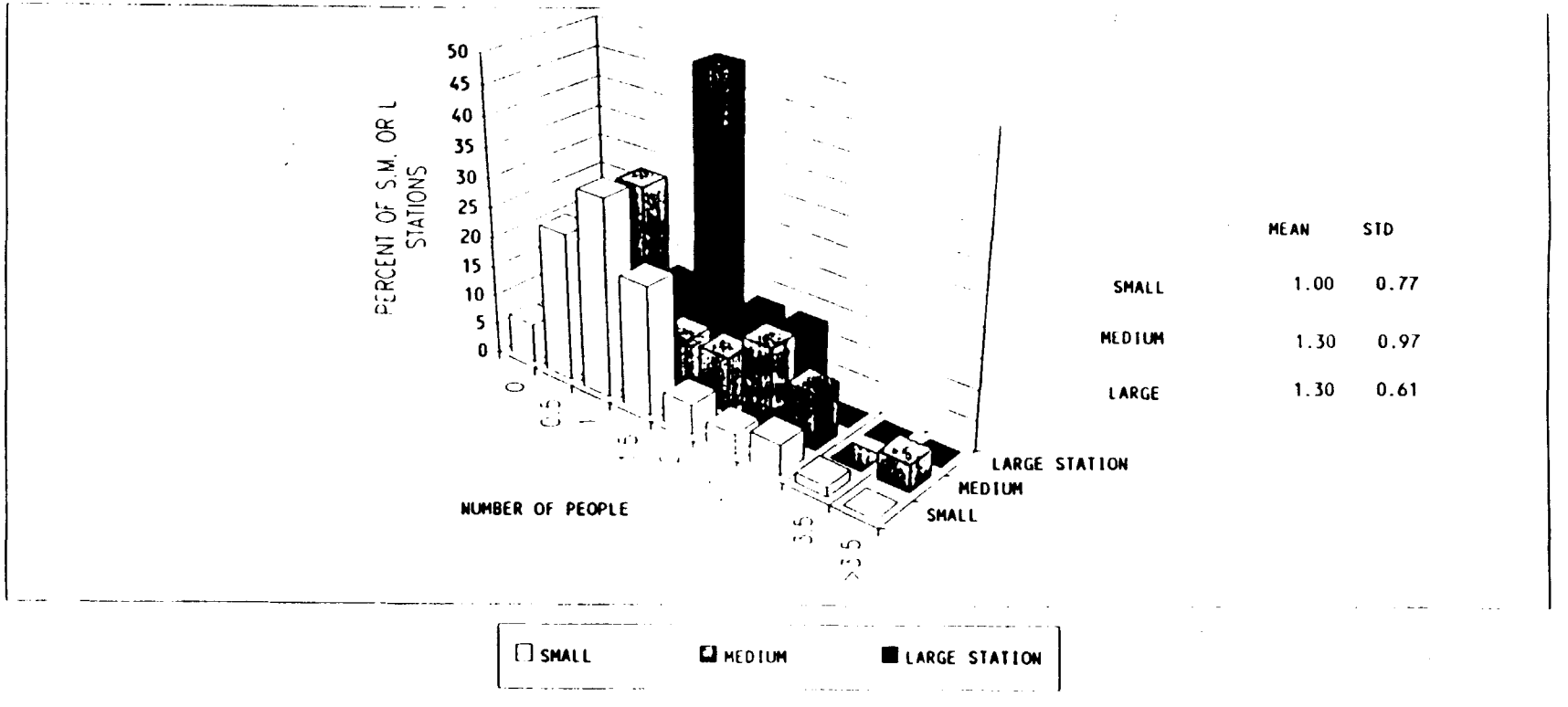
| STATION SIZE | | | | | |
|---|---|---|---|---|---|
| MEDIUM | | | LARGE | | |
| TOTAL | MEAN | STD | TOTAL | MEAN | STD |
| 44 | 2 | 0 | 26 | 3.25 | 0.43 |
| 92 | 4.18 | 1.59 | 55 | 6.88 | 2.62 |
| 35 | 1.59 | 0.72 | 15 | 1.88 | 1.05 |
| 6 | 0.27 | 0.45 | 3 | 0.38 | 0.48 |
| 16 | 0.73 | 0.45 | 5 | 0.63 | 0.48 |
| 405 | 18.4 | 10.2 | 181 | 22.6 | 10.9 |
| 124 | 5.6 | 4.2 | 53 | 6.6 | 4.8 |
| 361 | 16.4 | 13.8 | 152 | 19 | 13.2 |
| 203 | 9.2 | 6.4 | 104 | 13 | 9.7 |
| 33 | 1.5 | 1.16 | 19 | 2.38 | 1.32 |
| 242 | 11 | 5.46 | 139 | 17.38 | 13.67 |
| 176 | 8 | 3.8 | 66 | 8.25 | 2.73 |
| 54 | 2.45 | 2.13 | 66 | 8.25 | 12.89 |
| 12 | 0.55 | 1.88 | 4 | 0.5 | 1.32 |
| 48.5 | 2.2 | 0.89 | 20 | 2.5 | 1.32 |
| 127.2 | 5.78 | 2.67 | 54.2 | 6.78 | 3.12 |
| 71 | 3.23 | 1.76 | 23 | 2.88 | 0.93 |
| 55 | 2.5 | 0.89 | 19 | 2.38 | 0.86 |
| 84 | 3.82 | 1.72 | 30 | 3.75 | 1.39 |
| 1 | 0.13 | 0.33 | 1 | 0.13 | 0.33 |
| 21 | 0.95 | 0.21 | 7 | 0.88 | 0.33 |
| 1158.5 | 52.7 | 53.3 | 1011 | 126.4 | 105.7 |
| 1678.5 | 76.3 | 109.9 | 1271 | 158.9 | 101.8 |
| 17 | 0.77 | 0.42 | 3 | 0.38 | 0.48 |
| 5 | 0.23 | 0.42 | 5 | 0.63 | 0.48 |
| 11 | 0.5 | 0.5 | 5 | 0.63 | 0.48 |
| 11 | 0.5 | 0.5 | 3 | 0.38 | 0.48 |
| 1 | 0.05 | 0.21 | 0 | 0 | 0 |
| 21 | 0.95 | 0.21 | 8 | 1 | 0 |
| 2 | 0.09 | 0.42 | 0 | 0 | 0 |
| 6 | 0.27 | 0.45 | 2 | 0.25 | 0.43 |
| 16 | 0.73 | 0.45 | 6 | 0.75 | 0.43 |
| 42 | 1.91 | 3.33 | 13 | 1.63 | 3.31 |
| 4 | 0.18 | 0.39 | 2 | 0.25 | 0.43 |
| 18 | 0.82 | 0.39 | 6 | 0.75 | 0.43 |
| 75 | 3.41 | 8.13 | 10 | 1.25 | 3.31 |
| 1% | 38.6% | 25.3% | | 43.0% | 21.9% |
| 3 6.5 | 0.3 | 1.07 | 1 | 0.13 | 0.33 |
| 9% | 33.1% | 30.4% | | 39.5% | 18.5% |
| 1 3 | 0.14 | 0.46 | 0.25 | 0.03 | 0.08 |

# (1) NUMBER OF STUDIOS/STATION

1=SMALL, 2=MEDIUM, 3 or >=LARGE STATION

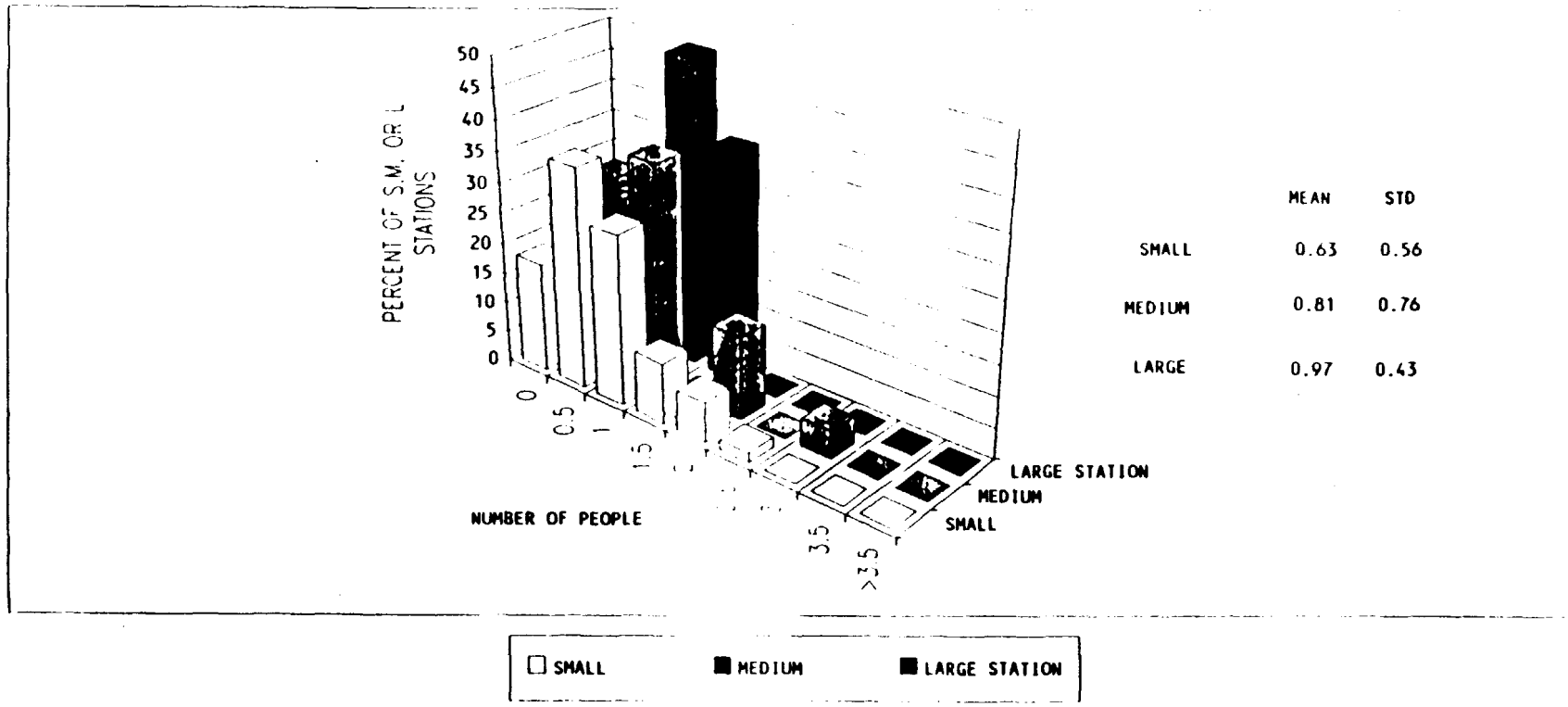


PEOPLE AVAILABLE FOR
CRASH DESIGN OF PRODUCTION FACILITY



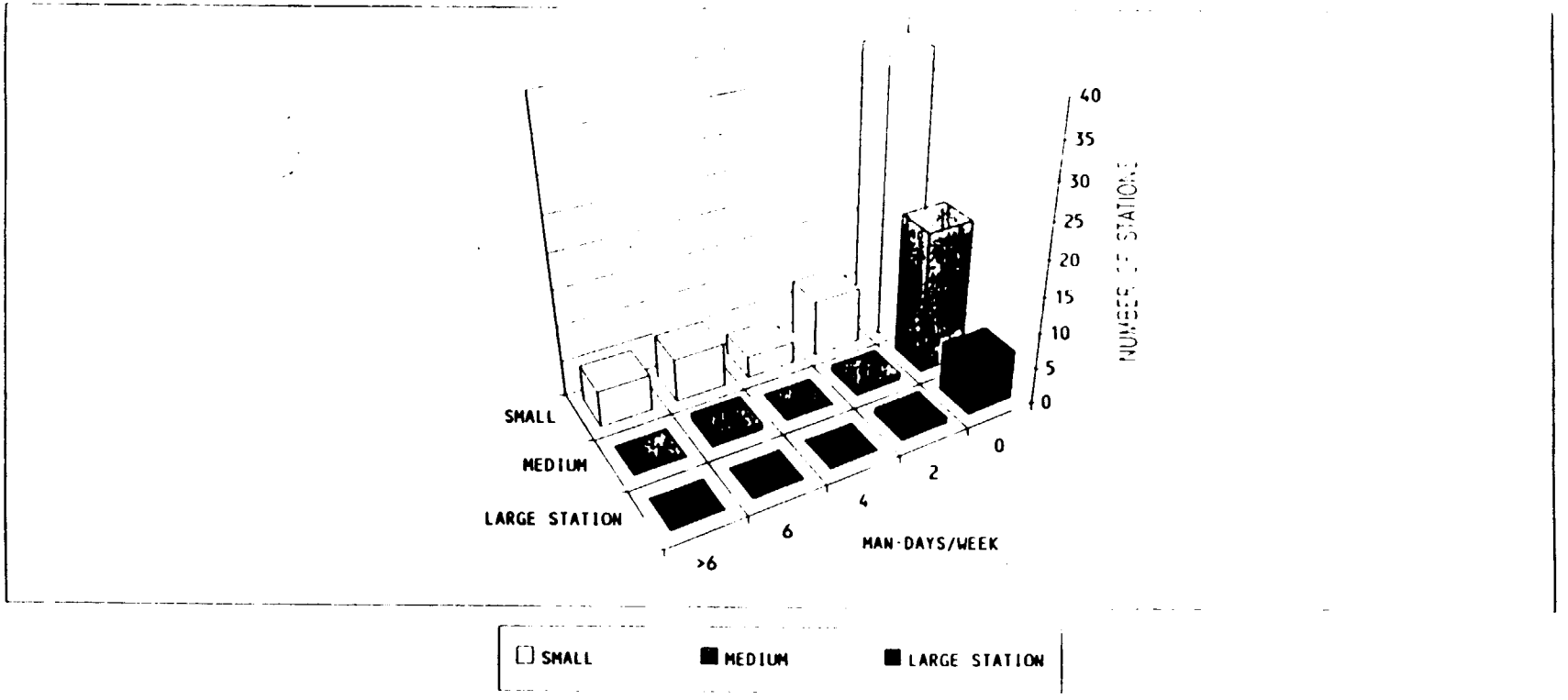

| | MEAN | STD |
|---|---|---|
| SMALL | 1.00 | 0.77 |
| MEDIUM | 1.30 | 0.97 |
| LARGE | 1.30 | 0.61 |

PEOPLE AVAILABLE FOR
CRASH DESIGN OF TRANSMITTER FACILITY

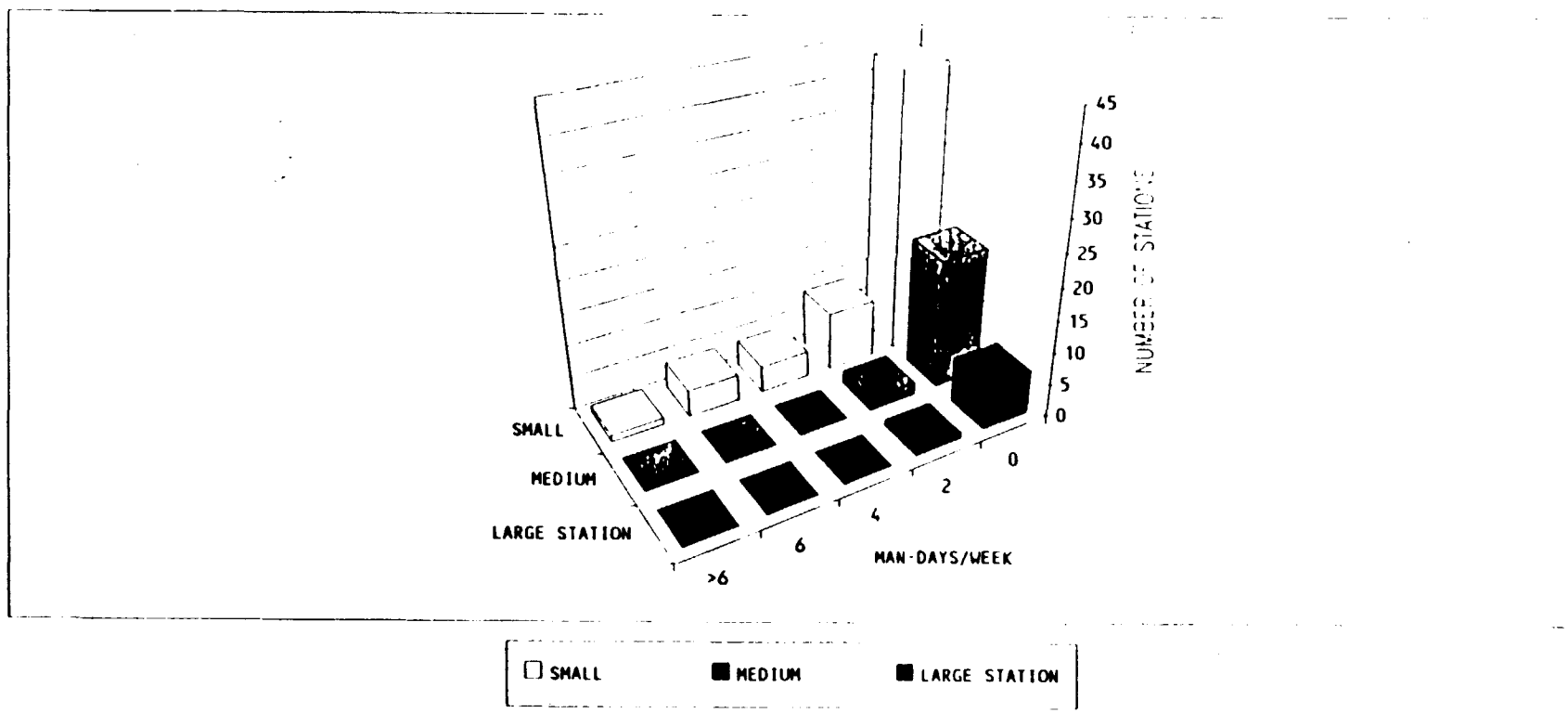



| | MEAN | STD |
|---|---|---|
| SMALL | 0.63 | 0.56 |
| MEDIUM | 0.81 | 0.76 |
| LARGE | 0.97 | 0.43 |

(36)EFFORT PROVIDED BY OWNER/GROUP
FOR CRASH DESIGN OF NEW STUDIO FACILITY



(38)EFFORT PROVIDED BY OWNER/GROUP
FOR CRASH DESIGN OF NEW XMTR FACILITY



## REPORT OF IS/WP-2: STUDY RESULTS AND PRELIMINARY CONCLUSIONS

As part of its work in producing Implementation Plans for Advanced Television, IS/WP-2 has developed significant information that can be of substantial use to the FCC and to other parts of the Advisory Committee while IS/WP-2 is completing its work. The information derives from a series of surveys and studies conducted to date by the Working Party. This report provides the highlights of that data in the hope that others will find it both important and helpful. Note that this report and the data that supports it were developed prior to an FCC rulemaking on implementation issues anticipated to be released on 10/24/91.

The Working Party has identified the tasks required for implementation by all industry segments. With the participation of experts from each industry segment, it has determined the time required for completion of each of these tasks. From this data, it has constructed a series of PERT networks and timelines showing the overall process and timing for completion of the transition to HDTV.

IS/WP-2 has surveyed the owners of all station groups having 3 or more stations and some additional groups with 2 stations (107 in all), seeking their expectations for implementation of HDTV transmission and looking at the problems they will face. It has surveyed the chief engineers of approximately 100 stations, looking at the resources each has and will require to carry out the implementation. It has also instigated discussions among the television stations in some of the larger markets both to understand the problems they may face and to give them a head start in addressing them. The results of some of this work underlie the data reported herein.

Both CBS and PBS have provided input on their expectations for a transition to HDTV, and their results have been incorporated into the Working Party's output. IS/WP-2 has become cognizant of the work done by PS/WP-5 in projecting the penetration of HDTV among the viewing public. This report attempts to bring coherence to these several efforts, all of which concern the relationship between the HDTV transition and time.

### Station Conversion Will Be Time Phased

Because of limited resources, both capital and personnel, group owners intend to stagger the conversion of their stations. A similar approach, in which increasing numbers of stations started the transition process in succeeding years, was adopted in the CBS study. As in the CBS study, the owners plan to start with the stations in the largest markets first, moving later to the smaller markets.

Many television station owners anticipate a relatively early start of conversion to HDTV simulcast operation. Of the 61 respondents to date, representing 260 stations in their responses, 42 groups expect to start conversion of their first station within years 1, 2, and 3 following the final FCC decision on a system. They further indicate that half of the stations covered by the survey responses will start their conversions within those three years. On average, owners expect to take 1½ to 2 years after start to reach the stage of being able to "pass through" the

network or equivalent syndicated programming. Completion times for full conversion to HDTV local origination are expected by the owners (and by CBS) to take significantly longer. These expectations are in substantial agreement with the times determined by the Working Party to be required to complete the various tasks if all tasks are accomplished in the minimum possible times. It should be noted that singly-owned stations were not included in the survey.

The CBS study shows the first 30 stations, located in the top 10 markets, completing the "pass through" stage in the first year. IS/WP-2's work indicates this to be somewhat optimistic. If all tasks, including governmental approvals, are accomplished in minimum feasible times, approximately 1½ years are needed to get on the air if tower space is available and approximately 2¼ years if a new tower must be built. Since the tasks include local government approvals, environmental impact statements for new towers, FCC construction permits, and the like, it is not anticipated that the minimum times (assumed to be 90 days per approval) are likely to be achieved in many markets. We believe more normal zoning, planning, and environmental approval times will result in "pass through" implementation times of 2¼ years without a tower and 3½ years with a tower. In some major markets, even longer governmental approval times are likely to be encountered. The work of the Local Area Groups (chief engineers of all stations in an area), enlisted by IS/WP-2 in five major cities, determined in four of them that adequate tower space is not currently available for HDTV transmission. The very fact of our inquiry has stimulated the chief engineers in several of these communities to look further into the problems they will face and to begin identifying possible solutions to them.

The staggering of conversions anticipated by both CBS and the group owners surveyed (even with their assumptions about conversion time) results in approximately 50 per cent of the stations reaching "pass through" after five years. CBS indicates that most of the stations converting after the first five years will be smaller stations, many in smaller markets.

It must be recognized that the time at which stations receive uncontested channel assignments is the starting point for calculating the various time aspects of the transition to HDTV. It is anticipated that the FCC will make channel assignments during the process of establishing the rules for HDTV service. If the channel assignments are made later, the time taken to make the assignments will add directly to the implementation time. Similar consideration must be given to the documentation and dissemination of the technical details of the selected system sufficient for manufacture of both broadcast and consumer equipment, or a similar addition to the implementation time will be required.

### Manpower Resources to Accomplish Conversion

One area which the Working Party has been exploring is the availability of qualified personnel to carry out the design work required to implement the conversion to HDTV. This concerns two distinct aspects of design - transmission facilities and studio or production facilities. The survey of group owners showed that there is a small resource available from headquarters operations of some to supplement the personnel at the stations in designing the new facilities. In addition, some owners may be able to provide some assistance to the stations by moving personnel between their operations on a temporary basis to carry out the conversions. This reinforces the need to have some stations convert later in order to help others convert sooner. Assuming such staging of stations, adequate personnel seem to be available to reach the "pass through" stage

in the time frames discussed above, especially if vendors and consultants can pick up a significant part of the transmitter work effort.

The personnel requirements are far more acute for the studio conversion for local origination than for the transmitter and studio "pass through." This results from the fact that the studio conversion represents a much greater change and a much greater expenditure. It is also likely to take considerably longer to achieve because of the magnitude of the conversion required.

### Consumer Electronics

Another aspect of the Working Party's effort has been to investigate the time expected for consumer electronics manufacturers to begin production and sales of receivers compatible with the new transmission system. IS/WP-2 has consulted with receiver manufacturers and developed a time schedule, reflected in PERT charts and timelines, for the development and introduction of television receivers. The current estimates is that it will take approximately 3½ years from the time that adequate information for product design becomes available to the manufacturers for product to begin entering the distribution chain. Separately, PS/WP-5 has made forecasts of the penetration over time of HDTV receivers in the marketplace.

When considering time forecasts for implementation, the starting point for system-specific equipment design is the availability of adequate technical information. The first major task in the implementation is the design of products and their introduction into the marketplace. Translating the penetration data developed for HDTV receivers by PS/WP-5 into this context is necessary before actual dates can be applied to the penetration forecast. The penetration forecast currently starts with 1 per cent penetration of HDTV sets and extends to between 5 and 10 per cent 5 years later. Working backwards, an optimistic estimate by PS/WP-5 is that 1 per cent may be reached two years after product introduction, depending solely on cable and rental tape as program sources. The work of IS/WP-2 on the timing of receiver development indicates that receivers may be generally introduced approximately 2½-3 years after the FCC Report and Order, provided full technical information is available at the time of the NPRM. Some believe that the successful proponent may, in some cases, have a small time advantage. This indicates that 1 per cent penetration may be reached 4 to 5 years following the FCC Order.

### Availability of Technical Information

Time will be required to develop a description of the selected system sufficiently complete to permit the design and manufacture of consumer electronics and professional equipment products. The information currently being provided to the Advisory Committee through SS/WP-1 is not sufficient for such a purpose. Expectations with respect to and a mechanism to accomplish dissemination of the required information are yet to be determined.

Details to support the discussion above and information regarding other work of the Working Party are available upon request.

Appendix D

# FCC Advisory Committee on Advanced Television Service

## Implementation Subcommittee

## Working Party 2 on Transition Scenarios (IS/WP-2)

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## Survey of Consumer Electronics Manufacturers

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Name _____

Company _____

☐ Response will be provided by another person from this company.

Name of respondent: _____

Please examine the associated PERT and Gantt charts before answering the questions. The numbers in the blocks on the PERT chart are: the task number at the top left, the duration in days on the right side, the projected start date on the bottom left, and the projected finish date on the bottom right. The items in ellipses are milestones; they all have zero duration. The critical paths are shown as solid lines and the non-critical paths as dotted lines.

The durations shown in both the PERT and the Gantt charts are in calendar days, as opposed to work days. The durations have been adjusted to generally make events begin and end on the first, middle, or last days of a month. The bars on the Gantt chart sometimes extend slightly beyond the actual dates of their related tasks. This results from the time granularity of the computer program that generated the chart. For accurate determination of the dates, please use the PERT chart.

In answering the questions below, please remember that the study is targetted to modelling the general case of a non-proponent receiver manufacturer. Please apply what you know about your own company's development process to such a general case. If there are several products or product lines about which you could respond and for which there would be different answers, please consider the one(s) with the shortest time to market. Use the back of the page if you need more room for your answers.

1. Are the tasks shown on the PERT chart the right ones? Yes ☐ No ☐

   a. If "No," should tasks be added, deleted, or modified? Added ☐ Deleted ☐
   (Checking any combination is allowed.) Modified ☐

b. If tasks should be added, please briefly describe the tasks and indicate the tasks that preceed and follow them by task number.

c. If tasks should be deleted, please indicate the task numbers:

d. If tasks should be modified, please give the task number and briefly describe the changes required.

2. Do you agree with the durations given for the tasks? Yes ☐ No ☐

   a. If "No," which task numbers should be changed and what durations should they have?

3. Do you agree with the assumptions given? Yes ☐ No ☐

   a. If "No," what assumptions should be added? Which should be deleted? Which should be changed and how?

4. What can be done to shorten the time to production? Consider both the tasks themselves and any external factors or assumptions that might impact the development time.

5. If your company also manufactures VCRs, would the development process and timing be about the same as for television receivers? Yes ☐ No ☐

   a. If "No," how would they be different? What factors might influence the difference?

   b. What can be done to shorten the time to production for VCRs?

**Please return this questionnaire no later than Friday, February 21, 1992. Thank You!**

# FCC ADVISORY COMMITTEE ON ADVANCED TELEVISION SERVICE IMPLEMENTATION SUBCOMMITTEE WORKING PARTY 2 ON TRANSITION SCENARIOS (IS/WP-2)

## MATERIALS FOR PROPONENTS

## INDEX

1. Introduction

   The outline for the introductory presentation is included in the advance mailing. It will be replaced with copies of the overheads used in the actual presentation at the meeting of January 13, 1992.

2. Broadcast & Production Information

   A. Local Station: Widescreen 525/2:1, 16:9 - Scenario 2

      i. Supporting List of Assumptions

         Provides General and Specific Assumptions that underlie the PERT and Gantt Charts related to the same scenario. See the Introduction materials for explanations of the scenarios. Included in the specific assumptions for studio implementations are lists of equipment required for each task in the implementation process. This description applies to all the Broadcast & Production scenarios excluding those where exceptions are noted.

      ii. PERT Chart

         The PERT chart shows all of the tasks required for implementation of a given scenario and their dependencies upon one another in network form. It includes the start and end dates of tasks and their durations. It also identifies certain milestones in the implementation. The dates given and the durations used are only inserted for the purpose of studying the relationships of the tasks and are not to be taken as actual values.

         At several points, a number of tasks are shown occurring in parallel. These most likely cannot be accomplished in parallel because of limitations in the resources available to carry them out. They would consequently have to be done at least partially sequentially. This

description applies to all the Broadcast & Production scenarios excluding those where exceptions are noted.

The PERT chart for Local Station Scenario 2 includes some additional tasks at the start of the process (Tasks 41 & 42 and Milestone 43) that are a first attempt at showing the relationship of the availability of technical information to the remainder of the process. The relationship exists in all of the scenarios but currently is shown here only.

iii. Gantt Chart

The Gantt chart shows the tasks and milestones in the implementation of the various scenarios in time schedule form. (The dependencies are also indicated.) The start and end dates are drawn directly from the values in the PERT charts. The Gantt chart bars may not indicate the dates precisely. For precise timing, refer to the dates in the associated PERT chart.

The Gantt chart for Local Station Scenario 2 includes the same additional tasks concerning availability of technical information described above for the PERT chart. When they are finalized, they will be inserted at the appropriate place in the list of tasks and milestones.

B. Local Station: Full HDTV Replacement - Scenario 3

i. Supporting List of Assumptions
ii. PERT Chart
iii. Gantt Chart

C. Network: Widescreen 525/2:1, 16:9 - Scenario 2

i. Supporting List of Assumptions

Only General assumptions are provided. The Specific assumptions for particular tasks are quite similar to those for equivalent tasks in the Local Station Scenario 2 implementation.

ii. PERT Chart
iii. Gantt Chart

D. Network: Full HDTV Replacement - Scenario 3

i. Supporting List of Assumptions

Only General assumptions are provided. The Specific assumptions for particular tasks are quite similar to those for equivalent tasks in the Local Station Scenario 2 implementation.

ii. PERT Chart
iii. Gantt Chart

E. Production/Post: Widescreen 525/2:1, 16:9 - Scenario 2

i. Supporting List of Assumptions

Only General assumptions are provided. The Specific assumptions for particular tasks are quite similar to those for equivalent tasks in the Local Station Scenario 2 implementation.

ii. PERT Chart
iii. Gantt Chart

F. Production/Post: Full HDTV Replacement - Scenario 3

i. Supporting List of Assumptions

Only General assumptions are provided. The Specific assumptions for particular tasks are quite similar to those for equivalent tasks in the Local Station Scenario 2 implementation.

ii. PERT Chart
iii. Gantt Chart

G. Transmitter: Single-Channel, Compatible - Scenario 1

i. Supporting List of Assumptions
ii. PERT Chart
iii. Gantt Chart

H. Transmitter: Simulcast w/Existing Tower - Scenario 2

i. Supporting Lists of Assumptions

a. Typical Time - Scenario 2A

Typical times are based on the experience of broadcasters in gaining regulatory approvals and constructing facilities. They include time for litigation and assume the channel assignment process will occur following the establishment of HDTV service by the FCC.

b. Minimum Time - Scenario 2B

Minimum times assume accelerated regulatory approvals (90 days at all stages) combined with broadcaster experience in constructing facilities. They assume no litigation and channel assignment no later than the time of establishment of HDTV service by the FCC.

ii. PERT Chart (Scenario 2A)

Only the PERT chart for the Typical time is provided. The network for the Minimum time scenario (2B) is identical with the exception of zero durations for the channel assignment and litigation tasks. Timing of the tasks for Scenario 2B can be seen on its Gantt chart.

iii. Gantt Charts

a. Typical Time - Scenario 2A

See description of Typical time under the Assumptions heading immediately above.

b. Minimum Time - Scenario 2B

See description of Minimum time under the Assumptions heading immediately above.

l. Transmitter: Simulcast w/New Tower Required - Scenario 3

Considerations relating to the Typical and Minimum time implementations of this scenario are the same as those given under Scenario 2 immediately above.

i. Supporting Lists of Assumptions
   a. Typical Time - Scenario 3A
   b. Minimum Time - Scenario 3B
ii. PERT Chart (Scenario 3A)
iii. Gantt Charts
   a. Typical Time - Scenario 3A
   b. Minimum Time - Scenario 3B

3. Cable Television Information

A single Supporting List of Assumptions document, indexed under HDTV Distribution System Implementation below, provides the General assumptions for all of the categories concerned with Cable Television. It also provides Specific assumptions for the category under which it is listed, as explained below.

A. HDTV Distribution System Implementation

i. Supporting List of Assumptions

In addition to cataloging the General assumptions for the entire Cable classification, this list provides the Specific assumptions underlying a series of tasks related to the Implementation of HDTV Distribution on individual cable systems. Because the tasks are very few in number and minimal in scope and duration, PERT and Gantt charts have not been provided. The tasks comprise the installation of a few pieces of equipment at cable headends to add HDTV channels to existing distribution systems having adequate performance and channel capacity to accommodate them.

B. HDTV Distribution System Equipment Development

i. PERT Chart
ii. Gantt Chart